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## ABSTRACT

**Abstract:** Nitrite content in Edible Bird Nest (EBN) has been a serious crisis for multimillion EBN industries. Various government agencies, research institutes, universities and industries are looking for suitable methods to overcome this issue. Several methods are available for the detection and confirmation of nitrite content in raw-clean and raw-unclean EBN as well as EBN products. The nature of nitrite contamination in EBN shows that the concentration varies in different spots in the same cup of EBN. Thus, correct sampling is critical to ensure the result produced is representing the true concentration of nitrite in the sample. The method of choice must be selective and sensitive to comply with the regulation set at 30 ppm for raw-clean EBN and EBN products. This paper will discuss available and commonly used test methods in nitrite determination, which are UV-Vis Spectrophotometer, Ion Chromatography and Handheld FTIR.

## INTRODUCTION

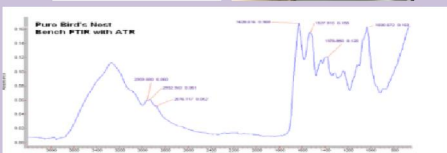
EBN industry begins with EBN collected from the cave, then producers started renovating shop houses or built new houses to attract swiftlets (*Aerodramus f. fuchipagus*) to produce EBN in their premises. Currently, there are more than 50,000 swiftlets premises throughout Malaysia and,

- 1083 premises are awarded with Animal Husbandary Accreditation Scheme (SALT)
- 15 processing plants are awarded for VHM
- 4 traders are awarded for GVHP

Department of Veterinary Services (DVS) is continuously monitor products coming from producers awarded with these schemes.

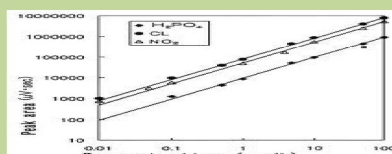
## VARIOUS TECHNIQUES OR METHODS AVAILABLE TO TEST NITRITE CONTENTS

### Handheld FTIR



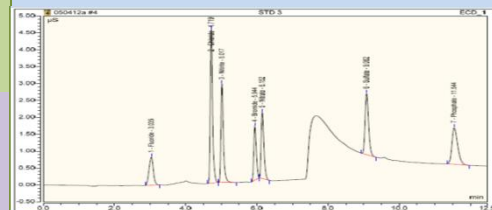
IR spectroscopy is the study of the interactions between infrared electromagnetic energy and matter, and allows for qualitative and quantitative measurements of samples. The spectrum will show the presence of protein in the EBN where major protein peaks can obviously be seen at about 1630  $\text{cm}^{-1}$ , 1530  $\text{cm}^{-1}$ , and 1030  $\text{cm}^{-1}$  while peaks above 2600  $\text{cm}^{-1}$  is contributed from lipid and carbohydrate (Seti, 2012). Presence of Nitrite is indicated by peak at 835  $\text{cm}^{-1}$ . Limitation of this technique is sample must be able to have direct contact with the EBN surface to get the spectrum. Any impurities like feathers, paint or salt will suppress the nitrite peak.

### UV-Vis Spectrophotometer



Almost all chemistry laboratory in Malaysia have this system because its capability to conduct various chemical tests. However, the user need to prepare their samples accordingly using some special chemicals to give specific reaction for chemicals they want to test. As for EBN samples, the analysis is done with some modification of the Malaysian Standard Method MS 954: Part 14:1988 (Ketty *et al.*, 2012). Limitation of this technique is the test results are dependent on the sample preparation which is tedious and take long hours to complete and human error in preparation may lead to wrong interpretation.

### Ion Chromatography.



The best but expensive method. The method is very specific to detect negative or positive ions thus it can separate all type of ions and at the same time determine their concentration. It involves minimum sample preparation steps and able to analyze samples in batch by using autosampler. This method is recommended for regulation purpose.

## DISCUSSION

There are various techniques or methods that can be used to test nitrite contents in samples depending on the purpose; screening, semi quantitative or confirmatory. Screening method is always use to monitor overall production status, while semi quantitative method can be used for monitoring as well as quality control measure that the producer may use to take further action in improving their products. Confirmatory method is usually expensive and only use for regulatory purposes. The nature of nitrite contamination in EBN shows that the concentration varies in different spots in the same cup of EBN. Thus, correct sampling is critical to ensure the result produced is representing the true concentration of nitrite in the sample.

## CONCLUSION

The method of choice must be selective and sensitive to comply with the regulation set at 30 ppm for raw-clean EBN and EBN products by Malaysian Standard 2334:2011 and SOP for Monitoring of raw clean EBN prepared by Ministry of Health.

## REFERENCES

- Set, J. 2012. Food Safety & Quality Check for Edible Bird Nest and Tomato Cultivers with Handheld FTIR. Agilent Food Safety Seminar. Kuala Lumpur. Malaysia.  
Ketty, G. S. L., Aziah, A. A., Faridah, I., Norakmar, I., Nurzia, I. & Roosnoor, F. H. 2012. An Overview of Nitrite Level in Malaysia Swiftlet's Nest. Proceedings of International Conference on One Health and 24th VAM Congress. 171-173.